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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/525,697 | 03/23/2006 | Thomas F. Soules | GL0Z 2 00122 | 7643 |

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| EXAMINER | |
|---|---|
| THAI, LUAN C | |
| ART UNIT | PAPER NUMBER |
| 2891 | |
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/525,697 | SOULES ET AL. | |
| | Examiner | Art Unit | |
| | Luan Thai | 2891 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *2/22/05; 10/18/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-9, 11-20, 22-27, and 29, are rejected under 35 U.S.C. 102(e) as being anticipated by Doxsee et al. (6,765,237).

Regarding claims1-9, 11-20, 22-27, and 29, Doxsee et al disclose (see specifically figures 3-4, column 2, line 41 to column 10, line 53) an LED device comprising a light emitting semiconductor (212) made of GaN, ZnSe or SiC (Col. 4, lines 24+); a transparent lens (218) made of glass or plastic and in hemisphere shape covering the semiconductor and spaced apart from the semiconductor by a distance at least about two times the length of a longest side of the semiconductor, as shown in figure 3. Doxsee et al's figure 3 also shows the inside surface of the lens (218) having a surface area at least ten times the exposed surface area of the light emitting semiconductor (212), a transparent filler (220) of polymer, plastic, glass, thermoplastic or epoxy (Col. 4, lines 36+), which is considered to have an refractive index closely matching the geometric mean of the refractive index of the LED device (212) and the lens (218), which are made of materials as described above. Doxsee et al further disclose a phosphor layer (222) having a substantially uniform thickness (see Figure 3) contained within or coated on an

inside or outer surface of the lens (218) (Col. 5, lines 28+), wherein the phosphor layer is made of $Tb_3Al_{4.9}O_{12}$:Ce (Col. 7, lines 57+), which is formed from a slurry comprising a scattering medium or a carrier solvent and a binder. Doxsee et al also disclose the LED (212) being a UV emitting LED having a primary emission in the range of 380 to 420 nm and emitting white light (Col. 5, lines 63+) and having a package efficiency of greater than 70% (Col. 7, lines 40+). Doxsee et al disclose that the LED can be supported by a reflector (430), which is coated with a dielectric powder known in the art (Col. 5, lines 52+), and the phosphor layer can be coating any location inside the package. Doxsee et al also disclose a method of forming the LED device and depositing the phosphor layer on the lens (see Col. 5, line 62 to Col. 8, line 30).

3. Claims 1-9, 11-20, 22-27, 29 and 31-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Komoto et al. (6,340,824).,.

Regarding claims1-9, 11-20, 22-27, 29, and 31-36, Komoto et al disclose (see specifically figures 30, 35, 47, 51, 86, 87, 89, 94, 104, 106, 121, 123, and 136, column 25, line 49 to column 69, line 52) an LED device and method of making thereof, comprising: a light emitting semiconductor (990) made of GaN, ZnSe, InGaN, SiC or AlGaN; a transparent lens (140D) made of epoxy or plastic and in hemisphere shape covering the semiconductor and spaced apart from the semiconductor by a distance at least about two times the length of a longest side of the semiconductor, as shown in figure 35. Komoto et al's figure 35 also shows the inside surface of the lens (140D) having a surface area at least ten times the exposed surface area of the light emitting semiconductor (990), a transparent filler (142), which is considered to have an refractive index closely matching the geometric mean of the refractive index of the LED device

(990) and the lens (140D, which are made of materials as described above. Komoto et al further disclose a phosphor layer (FL) having a substantially uniform thickness (see Figure 35) contained within or coated on an inside surface of the lens (140D), wherein the phosphor layer is made of $Tb_3Al_{4.9}O_{12}$:Ce (Col. 14, lines 31+), which is formed from a slurry comprising a scattering medium or a carrier solvent and a binder. Komoto et al also disclose the LED (990) being a UV emitting LED having a primary emission in the range of 380 to 420 nm and emitting white light (Col. 5, lines 63+) and having a package efficiency of greater than 70%. Komoto et al disclose that the LED can be supported by a reflector (110/2110), which is coated with a dielectric powder (2140a) (see Fig. 106), and the phosphor layer can be coating any location inside the package including cover the LED as disclosed in Figs. 104, 106-108. Komoto et al also disclose the LED device as described above may comprising a plurality of light emitting semiconductors (See Figs. 86-89 and 94) and an array of micro lenses formed thereon. Komoto et al further disclose the LEDs (4130c) emitting the blue light (Col. 64, lines 17+) and the device further comprising (see Fig. 136) a first band pass light filter (4510) positioned on the lens between the phosphor layer (4520) and the LEDs (4132), for passing the emission wavelength of the LEDs and reflecting the emission wavelength of the phosphor layer, and a second band pass light filter (4530) positioned on an exterior surface of the lens for passing the emission wavelength of the phosphor and reflecting the emission wave length of the LEDs (Col. 66, line 16 to Col. 68, line 27).

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 10, 21, 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Doxsee et al (6,765,237).

Regarding claims 10 and 28, Doxsee et al discloses the limitations of the claimed invention as detailed above except for specifying the solvent being selected from toluene, methyl ethyl ketone, methylene chloride. However, such materials are conventionally used in semiconductor art, specially in optical art, as a solvent for forming a phosphor layer on the lens of a LED. It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply toluene, methyl ethyl ketone, or methylene chloride as a solvent for forming a phosphor layer on the lens of Doxsee et al's device since such materials are known and commonly used in the art.

Regarding claims 21 and 30, Doxsee et al discloses the limitations of the claimed invention as detailed above except for specifying the thickness of the phosphor layer (e.g., from 6 to 100 μm (claim 21) or from 6 to 200 μm (claim 30)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to form the phosphor layer in the range 6 to 100 μm or 6 to 200 μm as claimed because the thickness of a layer is an art recognized variable of importance which is subject to routine experimentation and optimization, and it could be optimized by the practitioner. More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is 571-272-1935. The examiner can normally be reached on 8:00 AM - 4:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bradley W. Baumeister can be reached on 571-272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**/Luan Thai/**
**Primary Examiner, Art Unit 2891**

*Luan Thai*
Primary Examiner
Art Unit 2891
February 2, 2008